

ART. XLIX.—*The Crustacea of the Kermadec Islands.*

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THE *Crustacea* described in this paper are mainly the result of collections made by Mr. W. R. B. Oliver and his companions during their stay on the Kermadec Islands in 1908, but included among them are several that had previously been collected at the islands by Captain Bollons, of the Government steamer "Hinemoa," and by him kindly handed over to me.

Mr. Oliver has very generously intrusted his whole collection to me for identification, and has supplied me with a number of notes on the occurrence, habits, &c., of many of the species, most of which are incorporated below. The collection proves to be a very representative one of the crustacean fauna of the islands, including marine and shore forms, and also the few land and fresh-water species that were to be obtained.

Altogether it comprises 83 species, grouped as follows: *Decapoda*, 47; *Euphausiacea*, 1; *Amphipoda*, 14; *Isopoda*, 10; *Cirripedia*, 4; *Ostracoda*, 2; *Branchiopoda*, 1; *Copepoda*, 4. It will be seen that although the majority of the species belong to the *Decapoda*, as comparatively little attention could be devoted to the smaller forms, still nearly all the other divisions of the *Crustacea* are represented. The identification of all the forms of the different groups has been a somewhat difficult task in the absence of any large collection of named specimens for comparison and of some of the necessary works of reference. I have endeavoured in all cases to indicate the description on which I have relied for the identification, and, when necessary, to state briefly the points in which my specimens appeared to differ.

A few *Crustacea* were obtained by the "Challenger" Expedition by means of dredgings in the neighbourhood of the Kermadecs, but so far as I am aware no previous collection has been made actually at the Kermadec Islands themselves, and it is therefore perhaps a little surprising that nearly all the specimens prove to belong to species already known. A few new species are described, but the proportion of these is very small considering that the collection comes from an absolutely new locality, and even some of these new species must be looked upon as confessions of ignorance. However gratifying it may be to describe new and peculiar forms, it is still more pleasing to find how completely the more conspicuous members of the crustacean fauna of the seas surrounding the Kermadecs are now known. This prepares the way for attacking questions of distribution. In this paper, however, I cannot enter fully into this matter, and can merely state that nearly all the marine and littoral species are Australian or Indo-Pacific forms, many of them being already known from the east coast of Australia, New Caledonia, Lord Howe Island, or Norfolk Island, though several are now recorded from this region for the first time. Comparatively few of the marine forms extend to New Zealand. The affinities

of the few land and fresh-water forms are somewhat indefinite, owing to the incompleteness of our knowledge of these forms from neighbouring lands, but on the whole they appear to show more connection with New Zealand than the marine forms do.

A few of the species from the Kermadecs are of especial interest—e.g., the occurrence at these islands of the amphipod *Eurythenes gryllus* still further extends the distribution of this large amphipod, which has already attracted so much attention. It is perhaps worth while calling attention to the occurrence at the Kermadecs, and to the habits of *Actacomorpha erosa*, *Cryptochirus coralliodytes*, and *Porcellanopagurus tridentatus*.

Sufficient information about the size, position, &c., of the Kermadecs will be found in the papers by Mr. W. R. B. Oliver* and Mr. R. Speight† in a previous volume of the Transactions. Mr. Oliver has dealt specially with the botany, while some of the groups of animals have been already investigated by Mr. Edgar R. Waite,‡ Professor W. B. Benham,§ Dr. F. W. Hilgendorf,|| Professor H. B. Kirk,¶ and Mr. T. Iredale.** It will be sufficient to state here that the Kermadecs form a group of four islands lying in a line extending from Sunday Island (lat. 29° 50' S., long. 177° 59' W.) to French Rock (lat. 31° 24' S., long. 178° 51' W.). The whole group lies about half-way between New Zealand and the Tonga Islands.

I have followed the classification given by Dr. W. T. Calman in his account of the Crustacea in Ray Lankester's "Treatise on Zoology," but as a matter of convenience I have placed the *Decapoda* first. Only those synonyms and references have been given that appear to be necessary.

My hearty thanks are due to Mr. Oliver for the opportunity of examining the collection, and for the thorough manner in which he collected and carefully recorded all the specimens available. I am also indebted to Professor Benham and Messrs. Waite and Hamilton for the loan of books from the libraries under their control.

LIST OF SPECIES.

Subclass MALACOSTRACA.

Order DECAPODA.

Suborder NATANTIA.

<i>Plesionika spinipes</i> Spence Bate.	<i>Alpheus socialis</i> Heller.
<i>Merhippolyte spinifrons</i> (Milne-Edwards).	? <i>Arete dorsalis</i> Stimpson.
<i>Alope palpalis</i> White.	<i>Synalpheus</i> sp.
<i>Rhynchocinetes rugulosus</i> Stimpson.	<i>Betaeus</i> sp.

* "The Vegetation of the Kermadec Islands," Trans. N.Z. Inst., vol. 42, p. 118.

† "Petrological Notes on Rocks from the Kermadec Islands," Trans. N.Z. Inst., 42, p. 241.

‡ "A List of Known Fishes of Kermadec and Norfolk Islands, and a Comparison with those of Lord Howe Island," Trans. N.Z. Inst., 42, p. 370.

§ "Stellerids and Echinids from the Kermadec Islands," Trans. N.Z. Inst., 43, p. 140.

|| "On some Calyptoblast Hydroids from the Kermadec Islands," Trans. N.Z. Inst., 43, p. 540.

¶ "The Sponges collected at the Kermadecs by Mr. Oliver," Trans. N.Z. Inst., 43, p. 574.

** "On Marine Mollusca from the Kermadec Islands," Proc. Mal. Soc., 9, pt. 1, p. 68 (March, 1910).

Suborder REPTANTIA.

- Jasus hugelii* (Heller).
Thenus orientalis Rumph.
Phyllosoma duperreyi Guérin.
Iconaxiopsis kermadecensis sp. nov.
Petrolisthes lamarckii var. *rufescens* (Heller).
Pachycheles lifuensis Borradaile.
Callianassa articulata Rathbun.
Upogebia danai (Miers).
Clibanarius striolatus Dana.
Calcinus imperialis Whitelegge.
Porcellanopagurus tridentatus Whitelegge.
Eupagurus sinuatus Stimpson.
Eupagurus hectori Filhol.
Albunea microps Miers.
Dromia unidentata Ruppell.
Ovalipes bipustulatus (Milne - Edwards)
Actaeomorpha crosa Miers.
Xantho nudipes (Dana).
Xanthodes lamarekii (Milne - Edwards).
Ozius lobatus Heller.
- Trapezia ferruginea* var. *areolata* Dana.
Chlorodopsis melanochira A. Milne-Edwards.
Banareia armata A. Milne-Edwards.
Pilumnus fimbriatus Milne-Edwards.
Eriphia norfolcensis Grant and McCulloch.
Lophaetaca actaeoides A. Milne-Edwards.
Plagusia chabrui (Linn.).
Plagusia dentipes De Haan.
Plagusia tuberculata Lamarck.
Pereon pilimanus (A. Milne-Edwards).
Geograpsus grayi Milne-Edwards.
Leptograptus variegatus (Fabr.).
Cyclograpsus lavauri Milne-Edwards.
Planes minutus (Linn.).
Ocypoda kuhlii De Haan.
? *Cryptochirus coralliodytes* Heller.
Halimus spinosus Hess.
Huenia proteus De Haan.
Schizophrys hilensis Rathbun.

Order EUPHAUSIACEA.

Thysanoessa gregaria G. O. Sars.

Order AMPHIPODA.

- Nannonyx kidderi* (Smith).
Eurythenes gryllus (Licht.).
Moera mastersii (Haswell).
Melita inaequistylis (Dana).
? *Melita palmata* (Montagu).
Aora typica Kröyer.
? *Orchestia gammarellus* (Pall.).
- Parorchestia tenuis* (Dana).
Parorchestia sylvicola (Dana).
Phrosina australis Stebbing.
Phronima novae-zealandiae Powell.
Platyscelus intermedius Thomson.
Oxycephalus clausi Bovallius.
Caprella aentifrons Latreille.

Order ISOPODA.

- Rocinela orientalis* Schiödte and Meinert.
Meinertia imbricata (Fabricius).
Nerocila macleayi (Leach).
Dynamenella huttoni (G. M. Thomson).
Cilicaca caniculata (Thomson).
- Idotea metalliea* Bosc.
Ligia novae-zealandiae Dana.
Trichoniscus kermadecensis sp. nov.
Philoseia oliveri sp. nov.
Metoponorthus pruinosis (Brandt) [introduced].

Subclass CIRRIPIEDIA.

Order THORACICA.

- Lepas pectinata* Spengler.
Lepas denticulata Gruvel.
- Lepas anatifera* Linnaeus.
Lepas fascicularis Ellis and Solander.

Subclass OSTRACODA.

Order PODOCOPA.

Cypridopsis minna (King).| *Ilydromus smaragdinus* G. O. Sars.

Subclass BRANCHIOPODA.

Order CLADOCERA.

Daphnia thomsoni G. O. Sars.

Subclass COPEPODA.

Order EUCOPEPODA.

Cyclops sp.*Pandarus* sp.*Lepeophtheirus* sp.*Pontella* sp.

Subclass MALACOSTRACA.

Order DECAPODA.

Suborder NATANTIA.

Plesionika spinipes Spence Bate.*Plesionika spinipes* Spence Bate, Rep. Voy. "Challenger," 24, p. 646, pl. 113, fig. 2, 1888.

One specimen washed up on Terrace's Beach, Sunday Island.

It agrees well with Spence Bate's description and figures, except that the serrations on the underside of the rostrum are smaller than those shown in his figure. The "Challenger" specimens were dredged at a depth of 150 fathoms, at Station 219, north of New Guinea.

Merhippolyte spinifrons (Milne-Edwards).*Hippolyte spinifrons*, Milne-Edwards, Hist. Nat., Crust., 2, p. 377, 1837; Miers, Cat. N.Z. Crust., p. 80, 1876. *Merhippolyte spinifrons* G. M. Thomson, Trans. Linn. Soc., Zool., 8, p. 444, 1903.

Four specimens from Meyer Island.

These specimens agree well with Milne-Edwards's description, except that there are 2 minute teeth on the underside of the rostrum near the apex. As Spence Bate has pointed out, it is probable that by the expression "les épines suborbitaires" Milne-Edwards meant not the short antennal tooth, but the long spine on the first segment of the peduncle of the antenna, and this corresponds to his description.

I cannot reconcile Filhol's description and figure with this species.* The figure distinctly shows a large supra-ocular spine, and looks as if it had been taken from a specimen of *Alope palpalis*, and his description is not inconsistent with this supposition.*Alope palpalis* White.*Alope palpalis* White, Proc. Zool. Soc., 1847, p. 124, 1847; Miers, Cat. N.Z. Crust., p. 84, 1876; Thomson, Trans. Linn. Soc. (2), Zool., 8, p. 440, pl. 28, figs. 3-12, 1903. ? *Alope australis* Baker, Trans. Roy. Soc. South Aust., 38, p. 154, pl. 30, figs. 1-7, 1904; McCulloch, Rec. Aust. Mus., 7, p. 313, 1909.

Numerous specimens from Coral Bay, Sunday Island, and from Meyer Island.

* Mission de Pile Campbell, p. 431, pl. 53, fig. 13.

The largest of these is about 33 mm. in length, and agrees well with the description of this species given by Thomson, the rostrum having 4 teeth, with a fairly wide interval between the second and third; the external maxillipeds are greatly developed. In the other specimens, most of which are considerably smaller, there appears to be considerable variation in the number of teeth on the rostrum: in one specimen 27 mm. long the rostrum bears 6 teeth, somewhat unequal in size and a little unequally spaced; in other specimens there are only 4, and the interval between the second and third varies in extent. Although none of the specimens are as large as those sometimes met with in New Zealand, I prefer to refer them to the same species. I am doubtful whether *Alope australis* Baker is really distinct from this species. According to Mr. McCulloch, *A. australis* is common near Sydney Harbour.

·Rhynchocinetes rugulosus Stimpson.

Rhynchocinetes rugulosus Stimpson, Proc. Acad. Nat. Sci. Philad., 12, p. 36, 1860; McCulloch, Rec. Aust. Mus., 7, p. 310, pl. 79, figs. 1-8, 1909.
Rhynchocinetes typus Miers, Cat. N.Z. Crust., p. 77, 1876.

Three specimens from rock-pools, Sunday Island (Captain Bollons, 1907); two smaller one from Meyer Island (W. R. B. Oliver).

My specimens agree well with the description and figures given by McCulloch, and, like his, differ from *R. typus* Milne-Edwards in having only about 6 teeth on the upper distal margin of the rostrum and 13 below. The other differences given by Miss Rathbun (quoted by McCulloch) are not very important, and some of them do not apply to my larger specimens, in which the maxillipeds are proportionately longer than in smaller specimens. In recording *R. typus* from Peru, Miss Rathbun (Proc. U.S. Nat. Mus., 38, p. 562) gives the length as 11 cm.; my largest specimen is about 5 cm. In larger specimens one would naturally expect the teeth on the rostrum to be more numerous; and even if such large specimens are not found in Australian seas (McCulloch does not give the size of his specimens) it seems probable that *R. typus* and *R. rugulosus* are local varieties of a species widely spread in the Southern Hemisphere.

The species was included among the New Zealand *Crustacea* by Miers under the name *R. typus*, on the authority of specimens in the British Museum collections, though I am not aware of any specimens from the main islands of New Zealand in local collections. It occurs at Sydney and at Lord Howe Island. Milne-Edwards's specimens of *R. typus* are from the Indian Ocean.

Alpheus socialis Heller.

Alpheus socialis Heller, Voy. "Novara," Crust., p. 106, pl. 10, fig. 1, 1865; Miers, Cat. N.Z. Crust., p. 82, 1876; G. M. Thomson, Trans. Linn. Soc., Zool., 8, p. 436, pl. 27, figs. 6-12, 1903.

Two specimens from under stones at low-water mark, Coral Bay, Sunday Island, collected by Mr. T. Iredale.

These two specimens agree well with the original description given by Heller, and I have no doubt they belong to the species described by him; they also agree fairly well with the more recent description given by Thomson, but it is possible, as Stebbing has already pointed out, that more than one species is included by him under this name. In one of my specimens the right cheliped is the larger, while in the other it is the left; Thomson

states that in the specimens examined by him it is always the left that is the larger. The largest of my specimens measures 22 mm. in length—*i.e.*, half the length given by Thomson for his largest specimen.

? *Arete dorsalis* Stimpson.

? *Arete dorsalis* Stimpson, Proc. Acad. Nat. Sci. Philad., 12, 1860; Coutière, Fauna and Geog. Maldive and Laccadive Archipelagoes, vol. 2, pt. iv, p. 866, 1904.

Three specimens from Coral Bay, Sunday Island.

These specimens are only provisionally referred to this species; they agree with the description given by Coutière in most respects, but differ in having the inner margin of the fixed finger regularly convex and without separate teeth, while the carpus of the smaller chelipeds is made up of 4 joints instead of the typical 3 found in this genus. The Kermadec specimens will therefore probably form a separate species, but in the meantime I prefer to leave them provisionally under the above name.

Arete dorsalis is found at Samoa, New Caledonia, Hong Kong, and at the Laccadives.

Synalpheus sp.

From Coral Bay and Meyer Island; several specimens.

Owing to want of some of the necessary works of reference these specimens have not yet been satisfactorily identified; they represent one, or perhaps two, species.

Betaeus sp.

Four specimens from Coral Bay, Sunday Island, collected by Mr. T. Iredale.

Not yet identified. The species to which these specimens belong is quite distinct from *Betaeus aequimanus* Dana, which occurs fairly commonly on the New Zealand coasts.

Suborder REPTANTIA.

Jasus hügelii (Heller).

Palinurus hügelii Heller, Reise der "Novara," Crust., p. 96, pl. 8, 1868; Haswell, Cat. Aust. Crust., p. 172, 1882. *Palinurus tumidus* Kirk, Trans. N.Z. Inst., 12, p. 314, 1879.

One small specimen from Sunday Island; the dried abdomen of another was found on the beach at Denham Island.

The species is common on the east coast of Australia, and is occasionally taken in the northern part of Auckland.

Thenus orientalis Rumph.

Thenus orientalis Rumph, Mus., pt. 2, fig. D; Haswell, Cat. Aust. Crust., p. 170, 1882; Spence Bate, Rep. Voy. "Challenger," 24, p. 66, 1888; Borradaile, Trans. Linn. Soc., Zool., 13, p. 261, 1910.

A specimen 40 mm. long with bilobed rostrum and a strong spine on the abdomen appears to belong to this species, but the descriptions that I have been able to consult are short and incomplete.

Phyllosoma duperreyi Guérin.

Phyllosoma duperreyi Milne-Edwards, Hist. Nat., Crust., 2, p. 485, 1837 ;
Guérin-Méneville, Voy. de la "Coquille," p. 46. pl. 5. fig. 2. 1838 ;
Stebbing, Willey's Zool. Results, pt. 5, p. 609, 1900.

One specimen of this larval form was "cast up on Denham Bay Beach, Sunday Island, 31st May, 1908."

It is 26 mm. long and 18 mm. broad, and agrees closely with the description and figures given in the "Voyage de la 'Coquille.'"

It is not certainly known to what adult form *Phyllosoma duperreyi* belongs, but Professor Haswell, in describing the *Phyllosoma* stage of *Ibacus peronii* Leach [*I. incisus* Péron], says that it is not unlikely that *Phyllosoma duperreyi* is an earlier stage in the development of the same animal (Proc. Linn. Soc. N.S.W., 4, p. 280). His specimen was obtained at Port Jackson; the original specimen of *P. duperreyi* was obtained at the same place; while the one described by Stebbing is from Milne Bay, New Guinea.

Iconaxiopsis kermadecensis sp. nov. Figs. 1 and 2.

In general resembling *I. andamanensis* Alcock, but apparently differing in the following points: The rostrum not quite reaching to the end of the second joint of the antennular peduncle, triangular, margins towards the apex smooth, but with a prominent tooth on each side at the base of the rostrum, a slight ridge being continued backwards on the carapace from each of these lateral teeth; slightly further back are 3 smaller teeth closely placed in a transverse row on the carapace, one central and two lateral,

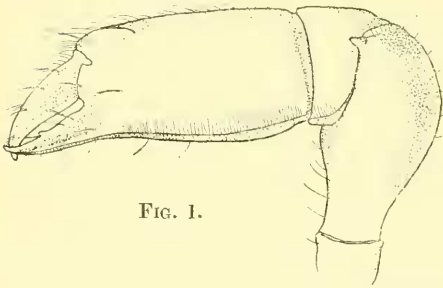


FIG. 1.

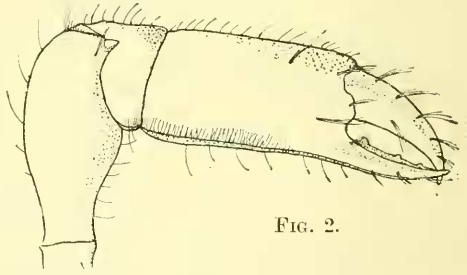


FIG. 2.

Iconaxiopsis kermadecensis.

Fig. 1. Left cheliped.

Fig. 2. Right cheliped.

with slight indications of ridges extending backwards from them. There is a small tuft of long hairs on the inner side of the base of each lateral tooth at base of rostrum, other long hairs fringe the margins of the rostrum, and there are a few scattered hairs on the carapace and abdomen.

Eyes short, well pigmented.

The first pair of chelipeds large, longer than abdomen, the left slightly larger than the right, propod in each compressed, with numerous hairs on the upper margin and a well-marked fringe on the lower margin just above a slight ridge which extends almost to the end of the fixed finger, rest of surface smooth; both fingers sharply pointed; movable finger

without definite teeth; fixed finger with 2 small teeth, one near the base and the other, slightly larger, about the middle of the inner margin; on the right cheliped sometimes a third tooth nearer the apex of fixed finger.

Length of carapace in largest specimen, including rostrum, 17 mm.; length of abdomen to end of telson, 29 mm.

Several specimens from Meyer Island and Coral Bay; others from rock-pools at Sunday Island, collected by Captain Bollons.

I am unable to identify this species with any descriptions known to me, and therefore describe it provisionally as new; it may, however, prove to be identical with some of the species of *Axius* already described. I am a little uncertain if it is properly placed in *Iconaxiopsis*, but it seems to agree well with Alcock's description of this genus.

Petrolisthes lamarckii var. *rufescens* (Heller).

?*Porcellana dentata* M.-Edwards, Hist. Nat., Crust., 2, p. 251, 1837. *Petrolisthes dentatus* Haswell, Cat. Aust. Crust., p. 146, 1882. *Petrolisthes lamarckii* var. *rufescens* Borradaile, Proc. Zool. Soc., 1898, p. 464, 1898 (with synonymy). *Petrolisthes lamarcki* Grant and McCulloch, Proc. Linn. Soc. N.S.W., 31, p. 38, 1906.

Several specimens found under stones on Meyer Island; others from Coral Bay, Sunday Island, collected by Mr. T. Iredale.

These specimens appear undoubtedly to belong to this widespread and variable species as understood by Borradaile, and, on the whole, they agree pretty closely with the variety *rufescens*. In the larger specimens the merus of the walking-legs usually bears on the upper margin a series of minute spines, but in the smaller specimens these are hardly distinguishable. Borradaile suggests that this variety is possibly a distinct species.

Pachycheles lifuensis Borradaile.

Pachycheles lifuensis Borradaile, Willey's Zool. Results, p. 424, 1900; Grant and McCulloch, Proc. Linn. Soc. N.S.W., 32, p. 155, pl. 1, figs. 2, 2a, 1907.

Numerous specimens from Coral Bay, Sunday Island, and from Meyer Island.

These specimens seem undoubtedly the same as those from Norfolk Island examined by Grant and McCulloch, and they appear to have been rightly referred to *Pachycheles lifuensis*, originally described from Lifu, Royalty Islands. Mr. Borradaile describes the left cheliped as being the larger, but the series of specimens before me shows that either the right or the left may be the larger.

Callianassa articulata Rathbun.

Callianassa articulata Rathbun, Bull. U.S. Fish. Comm. for 1903, p. 892, 1906.

A single specimen from a rock-pool, Sunday Island, collected by Captain Bollons in 1907.

This agrees well with Miss Rathbun's description of this species from Hawaiian Islands specimens, except that the cornea does not occupy quite so much of the eye-stalk, occupying less than one-half instead of more than one-half. The specimen also is considerably larger than Miss Rathbun's, the carapace being 12 mm. long and the abdomen 40 mm., while

an ovigerous male of her specimens was 6.4 mm. in length of carapace, with the abdomen 16 mm. long.

I have to thank Mr. A. R. McCulloch, of the Australian Museum, for kindly comparing this species with Australian forms, and for suggesting that it belonged to *C. articulata* Rathbun.

Upogebia danai (Miers).

Gebia danai, Miers, Ann. Mag. Nat. Hist., ser. 4, 17, p. 323, 1876; and Cat. N.Z. Crust., p. 70, 1876. *Upogebia danai*, Chilton, Trans. N.Z. Inst., 39, p. 460, 1907.

Two small specimens taken on rocks at low tide, Coral Bay, Sunday Island, by Mr. T. Iredale.

Clibanarius striolatus Dana.

Clibanarius striolatus Dana, U.S. Expl. Exped., Crust., pt. 1, p. 463, pl. 29, fig. 3 a-c, 1852; Haswell, Cat. Aust. Crust., p. 159, 1882; Alcock, Cat. Indian Decap. Crust., pt. 2, Anomura, p. 46, pl. 4, fig. 7, 1905 (with synonymy).

Two specimens collected by Mr. Roy Bell, and handed by him to Mr. Oliver.

They agree fairly well with the description and figure given by Alcock, and must, I think, belong to this species; the chelipeds are more spinituberculate than is shown in his figure, and in this respect appear to agree with the specimens from Port Denison referred to this species by Haswell. The rostrum is very short, and forms only a very slight projection, broadly rounded at the end.

Alcock gives the distribution of this species as follows: "Gulf of Aden and Seychelles eastwards to Tahiti; from about 43° E. eastwards to about 150° W., and from about 28° N. to about 18° S." Its occurrence at the Kermadecs extends the southern limit to about 30° S.

Calcinus imperialis Whitelegge.

Calcinus imperialis Whitelegge, Rec. Aust. Mus., 4, p. 48, pl. 9, 1901; Alcock, Cat. Indian Dec. Crust., pt. 2, Anomura, p. 164, 1905; Grant and McCulloch, Proc. Linn. Soc. N.S.W., 32, p. 154, 1907.

Several specimens among rocks at Meyer Island, inhabiting shells of *Delphinula*, *Litorium*, and *Gyrineum*; also one from Sunday Island (Captain Bollons).

The species is common at Norfolk and Lord Howe Islands, and has also been found on the coast of Australia, near Sydney.

Porcellanopagurus tridentatus Whitelegge.

Porcellanopagurus tridentatus Whitelegge, Mem. Aust. Mus., 4, p. 181, figs. 13, 13a, 13b, 1900.

Five specimens from Meyer Island and Sunday Island.

These specimens must, I think, be referred to Whitelegge's species, although naturally they differ in some minute points from his long detailed description. The anterior spine on the lateral margin of the carapace is very well marked in some specimens, but the posterior tooth is almost

or quite obsolete, the short prominence, however, being noticeable. The upper margin of the larger (right) cheliped is more even than is shown in Whitelegge's figure. The chelipeds are unequal in both sexes.

This hermit-crab is somewhat peculiar in its habits; it was found by Mr. Oliver under stones between tide-marks, and he states that it was not common, and that it never uses a spiral shell, but manages to keep on its back a single valve of a bivalve mollusc's shell or a vacant *Siphonaria* or limpet shell.

Only three species of this peculiar genus are as yet known—viz., *P. edwardsi*, from Campbell Island and the Snares; the present species; and *P. platei*, from Juan Fernandez. The description of this latter species I have not yet been able to obtain. Mr. Whitelegge's specimens were dredged in 54–59 fathoms, off the coast of New South Wales, and the species to which they belong is much smaller than *P. edwardsi*, and appears to differ also in having the chelipeds unequal in the female, while in the female of *P. edwardsi*, according to Filhol, the chelipeds are small and subequal.

Eupagurus sinuatus Stimpson.

Eupagurus sinuatus Stimpson, Proc. Acad. Nat. Sci. Philad., 10, p. 348, 1864; Haswell, Cat. Aust. Mus., p. 153, 1882; Alcock, Cat. Indian Decap. Crust., pt. 2, Anomura, p. 175, 1905.

Three specimens from Meyer Island seem to belong to this species. They agree fairly well with the short description quoted by Haswell, especially in having the merus of the chelipeds deeply excavated below, the margins provided with long cilia, and external margins spinose; the carpus, however, does not show much trace of a smooth median line, and the median series of spines on the propod is not well marked.

The species has been recorded from Port Jackson, Australia.

Eupagurus hectori Filhol.*

Eupagurus hectori Filhol, Mission de l'île Campbell, p. 419, pl. 51, fig. 1, 1885; Thomson, Trans. N.Z. Inst., 31, p. 177, 1899; Lenz, Zool. Jahr., 14, p. 447, 1901; Alcock, Cat. Indian Decap. Crust., pt. 2, Anomura, p. 176, 1905.

Numerous specimens from Meyer Island, and from Coral Bay, Sunday Island, living in shells of various gastropods. These agree closely with Filhol's description, and can be readily distinguished from other New Zealand species by the glabrous chelipeds. The chelipeds and the greater part of the ambulatory legs in spirit specimens are coloured red.

Filhol states that this species becomes more abundant to the south of New Zealand, especially in Stewart Island; Thomson records it from Stewart Island, and Lenz from D'Urville Island, and I have recently received a specimen from Miss Shand from Chatham Islands.

* I have also from Meyer Island several specimens of a small hermit-crab which in general resembles *Eupagurus*, but has the abdomen straight, though soft, and the telson and uropoda symmetrical. A fuller description is held over in the meantime, as I am not sure of the systematic position of the species.

Albunea microps Miers.

Albunea microps Miers, Jour. Linn. Soc., Zool., 14, p. 328, pl. 5, figs. 12, 13, 1877; Henderson, Rep. Voy. "Challenger," 17, p. 40, 1888; Borradaile, Willey's Zool. Results, pt. 4, p. 426, 1900.

One small specimen from Meyer Island (12 fathoms), agreeing well with Miers's description.

The species is recorded by Miers from Sooloo Island, and was taken by the "Challenger" at Station 212 in the Celebes Sea; more recently Borradaile has recorded it from Blanche Bay, New Britain.

Dromia unidentata Ruppell.

Dromia unidentata Ruppell, 24 Krabben roth. Meer., p. 16, pl. 4, fig. 2; pl. 6, fig. 9; 1830: Alcock, Cat. Indian Dec. Crust., pt. 1, Brachyura, p. 47, pl. 2, fig. 6, 1901.

One specimen taken on coral below low-water mark, Meyer Island; the hinder portion of the carapace covered with what appears to be the dried remains of a compound Ascidian.

This agrees closely with the description and figure given by Alcock.

The species is widely distributed in the Indian Ocean and the Malay Archipelago, but does not appear to have been recorded from Australian seas.

Ovalipes bipustulatus (Milne-Edwards).

Platyonichus bipustulatus M.-Edwards, Hist. Nat., Crust., 1, p. 437, pl. 17, figs. 7-10, 1834; Miers, Cat. N.Z. Crust., p. 32, 1876. *Ovalipes trimaculatus* Stebbing, South African Crustacea, pt. 2, p. 13, 1902; Doflein, Wiss. Ergebn. Deutschen Tiefsee Exped., 1898-99, p. 92, pl. 32, fig. 6, 1904; Fulton and Grant, Proc. Roy. Soc. Victoria, 19, pt. 1, p. 18, 1906. *Ovalipes bipustulatus*, M. J. Rathbun, Proc. U.S. Nat. Mus., 38, p. 577, 1910.

Several small specimens from Sunday Island, collected by Mr. Oliver, and one by Captain Bollons.

Mr. Oliver says that all the specimens collected were picked up dead on the beaches, and that apparently they live just below low-water mark. In connection with this, it is worth while mentioning that in March, 1888, Mr. R. Helms, of Greymouth, sent me specimens of this species that he had obtained at Greymouth whilst digging in the sand at low-water mark during spring tides for pipis (*Mesodesma spissa*), and he stated that the animal appeared to use the hind legs for digging in the sand more than for swimming, and that it buried itself in a remarkably short time. He added, "The colour of this animal is very fine; the carapace is light grey, almost lavender, and the joints of the arms bright red, tinging near the claws to dark orange."

The habits of *Platyonichus ocellatus* Herbst, as described by Verrill and Smith, seem to be closely similar. (See Stebbing, Hist. Crustacea, p. 67.)

The species is very widely distributed in the Southern Hemisphere, and extends also to Japan.

Actaeomorpha erosa Miers.

Actaeomorpha erosa Miers, Jour. Linn. Soc., Zool., 13, p. 1, pl. 14, 1883.

Several specimens from Coral Bay, Sunday Island, and from Meyer Island, on coral; some dredged in 12 fathoms.

These specimens agree minutely with Miers's description, drawn up from a single specimen dredged in 7 fathoms in Port Curtis, Australia. Some of the specimens have the dorsal surface variously marked with red, and this, together with the granulated nature of the surface, gives them the appearance of small pieces of coral.

Xantho nudipes (Dana).

Chlorodius nudipes Dana, Proc. Acad. Nat. Sci. Philad., 1852, p. 79, 1852; and U.S. Expl. Exped., Crust., 1, p. 209, pl. 11, figs. 12 *a-c*, 1855.

Leptodius nudipes A. Milne-Edwards, Nouv. Archiv. Mus., 9, p. 225, pl. 7, fig. 5, 1873; Miers, Cat. N.Z. Crust., p. 17, 1876; Filhol, Mission de l'île Campbell, p. 374, 1885. *Xantho (Leptodius) nudipes* Alcock, Proc. Asiatic Soc. Bengal, 67, p. 121, 1898.

Numerous specimens from Coral Bay, Sunday Island; Meyer Island, &c.

It is only with considerable hesitation that I assign these specimens to this species. In the rugose and wrinkled character of the hands of the chelipeds, and in the general appearance of the carapace, the short legs almost destitute of setae, &c., they appear to agree pretty closely with the description and figures given by A. Milne-Edwards, except that he describes the antero-lateral margins of the carapace as being divided into 10 or 12 teeth, grouped in 4 lobes. In my specimens the teeth are much fewer in number, the two posterior ones being simple and of the usual character, while anterior to these the lobes or teeth become somewhat indefinite, so that the anterior border might be described as being divided into 6 to 8 teeth. Alcock says, "The antero-lateral border is divided into 4 acute lobes or teeth, but each of the first 3 teeth have, at base, either one or two (one on either side) small additional cusps, and the 4th tooth is generally double, so that altogether there are from 8 to 11 teeth on the antero-lateral margin." This would agree moderately well with my specimens, except that in them none of the lobes or teeth are quite acute. On the other hand, Alcock places the species under the subgenus *Leptodius*, and specially mentions that "the fingers are typical spoons," and, so far as one can judge from the figure, this appears to be the case with the specimens figured by Dana. In my specimens the fingers are quite sharp at the points, and this seems to be the case with those figured by A. Milne-Edwards. Consequently, while I feel pretty confident that my specimens must belong to the same species as those described by Milne-Edwards from New Caledonia, I am doubtful if they are quite the same as those described by Alcock.

X. nudipes and the allied species *Chlorodius eudorus* Milne-Edwards are stated to occur in New Zealand on the authority of specimens in the collections of the Paris Museum; Filhol says that the specimens of *X. nudipes* come from Cook Strait, and he considers that *Chlorodius eudorus* should be looked upon as a variety of this species. I have seen no specimens from New Zealand itself that could be referred to either of these species.

Xantho (Leptodius) egyptus Alcock, from Galle and Mergui, and *Xantho quinquedentatus* Krauss, from South Africa, both seem to be closely similar

to *X. nudipes*, and the latter species is, according to Alcock, described and figured as having sharp fingers.

Considering the difficulty of determining species in this group, and the fact that I have no large series of specimens for comparison, the reference of my specimens from the Kermadecs to *X. nudipes* must be looked upon as provisional only.

Xanthodes lamarckii (Milne-Edwards).

Xantho lamarckii Milne-Edwards, Hist. Nat., Crust., 1, p. 391, 1834.

Xanthodes lamarckii Whitelegge, Mem. Aust. Mus., 3, p. 130, 1897;
Alcock, Proc. Asiatic Soc. Bengal, 67, p. 157, 1898.

Several specimens, male and female, from Coral Bay, Sunday Island, collected by Mr. T. Iredale.

These specimens agree closely with the description given by Alcock; the females have the abdomen fringed with long hairs, as described by Whitelegge.

The species is widely distributed in the Indo-Pacific region.

Ozius lobatus Heller.

Ozius lobatus Heller, Reise der "Novara," Crust., p. 21, pl. 2, fig. 4, 1868;
Haswell, Cat. Aust. Crust., p. 63, 1882.

Three specimens, two males and one female. Mr. Oliver says this species is fairly common among rocks between tide-marks.

The specimens that I have been able to examine agree minutely with Heller's description. The species is undoubtedly very closely allied to *O. truncatus* Milne-Edwards; but, as Heller points out, that species, according to the description and figures by Milne-Edwards and Dana, appears to have the front almost straight, while in *O. lobatus* it is divided into 4 lobes; the two inner ones are broad and rounded and the two outer ones are narrower and rather more prominent, being similar to the small rounded lobe at the inner angle of the orbit.

O. lobatus and *O. truncatus* are both recorded from Australia, and *O. truncatus* has also been found in New Zealand. The occurrence of *O. lobatus* at the Kermadecs renders it still more probable that the two species are identical, but a comparison of typical specimens is desirable before the two are combined.

Trapezia ferruginea var. *areolata* Dana.

Trapezia areolata Dana, Proc. Acad. Nat. Sci. Philad., 1852, p. 83, 1852;
and U.S. Expl. Exped., Crust., 1, p. 259, pl. 15, figs. 8 *a-b* and 9,
1853. *T. areolata* var. *incermis* A. Milne-Edwards, Nouv. Archiv.
Mus., 9, p. 259, pl. 10, fig. 6, 1873. *T. ferruginea* var. *areolata*
Alcock, Journ. Asiatic Soc. Bengal, 67, p. 221, 1898.

One female specimen (both chelipeds missing) from Meyer Island, found on coral, 1 fathom. The honeycomb network of fine brown lines on the carapace is still very plainly marked in the spirit specimen.

The species is widely distributed in Indo-Pacific seas.

Chlorodopsis melanochira A. Milne-Edwards.

Chlorodopsis melanochirus A. Milne-Edwards, Nouv. Archiv. Mus., 9, p. 228, pl. 8, fig. 5, 1873; Haswell, Cat. Aust. Crust., p. 55, 1882. *Chlorodopsis melanochira* Alcock, Journ. Asiatic Soc. Bengal, 67, p. 168, 1898.

Numerous specimens from Coral Bay, Sunday Island, and from Meyer Island.

These agree very closely with the descriptions and figures given by Milne-Edwards and Alcock, except that the dark coloration of the fixed finger does not extend along the lower border of the hand. In this character they resemble *C. melanodactylus*, but they distinctly differ from that species in having the antero-lateral margin "divided into four lobes, each of which is crowned with several spinules."

The species is known from the Andamans, the coasts of Australia, and from New Caledonia.

Banareia armata A. Milne-Edwards.

Banareia armata A. Milne-Edwards, Ann. Soc. Ent. Fr. (4), 9, p. 168, pl. 8, 1869; and Nouv. Archiv. Mus., 9, p. 193, 1873; Alcock, Journ. Asiatic Soc. Bengal, 67, p. 153, 1898.

One specimen (dried) from Meyer Island, and two small spirit specimens from Coral Bay, Sunday Island. The hands of the chelipeds and the joints of the legs are more granular than is shown in Milne-Edwards's figure, but the specimen agrees closely with Alcock's description, and must, I think, belong here.

The species is known to occur at New Caledonia and at the Andamans.

Pilumnus fimbriatus Milne-Edwards.

Pilumnus fimbriatus Milne-Edwards, Hist. Nat., Crust., 1, p. 416, 1834; Haswell, Cat. Aust. Crust., p. 66, pl. 1, fig. 4, 1882.

One specimen taken at low tide at Coral Bay, Sunday Island, by Mr. T. Iredale; another (dried) one from Meyer Island. They agree well with the descriptions given by Milne-Edwards and Haswell.

The species is known from the east coast of Australia.

Eriphia norfolcensis Grant and McCulloch.

Eriphia norfolcensis Grant and McCulloch, Proc. Linn. Soc. N.S.W., 32, pt. 1, p. 151, pl. 1, figs. 1, 1a, 1b, 1907.

Numerous specimens from Coral Bay, Sunday Island, and from Meyer Island, found under stones at low tide.

The species is common at Norfolk Island, where it is said to be known as the "poison crab."

Lophactaea actaeoides A. Milne-Edwards.

Lophactaea actaeoides A. Milne-Edwards, Nouv. Archiv. Mus., 9, p. 189, pl. 6, fig. 7, 1873.

One specimen from rock-pool, Meyer Island. It agrees well with Milne-Edwards's description and figure.

The species is found at New Caledonia, and I have a specimen from Norfolk Island also.

Plagusia chabrus (Linn.).

Cancer chabrus Linn., Syst. Nat., ed. 10, p. 628, 1758. *Plagusia capensis* De Haan, Faun. Japon., Crust., p. 58, 1835; Fulton and Grant, Proc. Roy. Soc. Victoria, 19, pt. 1, p. 20, 1906; Stebbing, South African Crustacea, pt. 3, p. 47 (with synonymy and critical remarks), 1905. *Plagusia chabrus* Miers, Cat. N.Z. Crust., p. 45, 1876, and Ann. Mag. Nat. Hist., ser. 5, 1, p. 152, 1878; Rathbun, Proc. U.S. Nat. Mus., 38, p. 591, 1910; Stebbing, Annals South African Mus., 6, p. 322, 1910 (with further synonymy).

One female specimen from Sunday Island. Mr. Oliver notes that only one specimen was seen during his stay on the island.

The species is widely distributed, and has been recorded from the Cape of Good Hope, Australia, Tasmania, New Zealand, &c.

In his latest work, Stebbing, in deference to the opinions of others, adopts the name *Plagusia chabrus* (Linn.) for this species, though he had previously argued in favour of *P. capensis* De Haan. I am glad that it is possible to retain the name by which the species has always been known in New Zealand.

Plagusia dentipes De Haan.

Grapsus (Plagusia) dentipes De Haan, Faun. Japon., Crust. decas, 2, p. 58, pl. 8, fig. 1, 1835. *Plagusia dentipes* Miers, Ann. Mag. Nat. Hist., ser. 5, 1, p. 152, 1878; Grant and McCulloch, Proc. Linn. Soc. N.S.W., 32, pt. 1, p. 153, 1907.

One male specimen, collected on the rocks between tide-marks, Sunday Island.

This species is closely allied to the preceding one, but can readily be distinguished by the spine on the lower distal angle of the merus in the walking-legs and by the presence of a few small tubercles on the carapace. The other differences pointed out by Grant and McCulloch seem hardly to apply in my specimens; thus, there is little difference between the front in the two, and both have the whole carapace equally covered with short hairs.

Plagusia dentipes is common on Norfolk Island and also on Lord Howe Island, but it has not been recorded from the main islands of New Zealand.

Plagusia tuberculata Lamarck.

Plagusia tuberculata Miers, Ann. Mag. Nat. Hist., ser. 5, 1, p. 148, 1878; Lenz, Zool. Jahrb., 14, heft 5, p. 473, 1901; Rathbun, Proc. U.S. Nat. Mus., 38, p. 590, 1910. *Plagusia depressa tuberculata* Rathbun, Bull. U.S. Fish. Comm. for 1903, p. 841, 1906. *Plagusia depressa* var. *squamosa* Grant and McCulloch, Proc. Linn. Soc. N.S.W., 32, p. 154, 1907.

Three females from Sunday Island.

Widely distributed in Indo-Pacific region. Recorded from Hawaiian Islands by Miss Rathbun, from Norfolk Island by Grant and McCulloch, and from "Lower California to Chile" by Miss Rathbun.

Percnon pilimanus (A. Milne-Edwards).

Acanthopus pilimanus A. M.-Edwards, Nouv. Archiv. Mus., 9, p. 300, pl. 14, fig. 5, 1873. *Leiolophus pilimanus* Miers, Ann. Mag. Nat. Hist., ser. 5, 1, p. 154, 1878. *Percnon pilimanus* Rathbun, Bull. U.S. Fish. Comm. for 1903, p. 842, 1906.

Two males and several females from Sunday Island.

These specimens agree very closely indeed with Milne-Edwards's description, except that there is no large tuft of fine hairs on the propod of the chelipeds; a well-marked tuft is, however, present on the merus of the larger male. The width of the abdomen of the larger male at the base is just equal to that of its length to the base of the last segment; in the smaller male the width is rather greater than this.

It is possible that these specimens should be referred to *P. planissimus*, but I assign them to *P. pilimanus* owing to the slightly narrower abdomen, the spines on the inner margins of the antennular cavities, and to the fact that they agree minutely with Milne-Edwards's description and figure except as regards the hairs on the propod of the chelipeds. The smaller specimens agree well with the description of *P. planissimus* given by Alcock (Journ. Asiatic Soc. Bengal, 69, p. 439), except that the second row of spinules on the merus of the legs is well marked on the third legs as well as on the first and second; in the larger specimens the row is also indistinctly marked on the fourth. Miss Rathbun records both species from the Hawaiian Islands without comment.

Milne-Edwards states that the hairs on the chelipeds act as a sponge to maintain the humidity at the orifice of the branchial chamber. He had, however, seen only one male specimen, and, as the tuft on the merus is very small or quite absent in my female specimens, it seems more likely that the hairs may be a sexual character, developed in the adult male only, and in that case may not yet be fully developed in the two males in my possession. The females resemble the male except in the much smaller size of the chelipeds, which are much shorter and have the propod only slightly widened. The merus bears only a very small tuft of hairs in the larger female specimens, and none in the smaller specimens. It seems likely, therefore, that the tufts of fine hairs on the merus and propod are a secondary sexual character, developed only in large males, or perhaps only during the breeding season; they were evidently not present in the adult males of *P. planissimus* examined by Alcock, for he makes no mention of them. If, as seems likely, the other characters—*i.e.*, the narrower abdomen and the spines on the inner margin of the antennular cavities—do not prove to be constant, one would be tempted to suggest that *P. planissimus* and *P. pilimanus* form one species, in which the males may develop the tufts of fine hairs on the chelipeds at certain seasons only.

Male: Width of carapace, 29 mm.; length, 32 mm.; total length of propod of cheliped, 15 mm.; width, 11 mm. Largest female: Width of carapace, 28 mm.; length, 31 mm.; total length of propod of cheliped, 8 mm.; width, 6 mm.

Mr. Oliver makes the following observations on the habits of this species: "Fairly common among rocks near low-tide mark. Very quick in its habits. Its colour somewhat resembles the rock, on which it stays perfectly still, but when any one approaches too near it darts into the water. When, after continued westerly winds, sand was driven ashore so as to bury the boulders on the north coast of Sunday Island to about half-tide

mark, thousands of these crabs, retreating before the encroaching sand, congregated in heaps among the rocks near shore until the sand was washed away again."

***Geograpsus grayi* (Milne-Edwards).**

Grapsus grayi M.-Edwards, Ann. Sci. Nat. (3^e ser.), 20, p. 170, 1853; Haswell, Cat. Aust. Crust., p. 98, 1882. *Geograpsus grayi* A. Milne-Edwards, Nouv. Archiv. Mus., 9, p. 288, pl. 16, fig. 1.

One male and one female, agreeing well with Milne-Edwards's description.

The species is widely distributed in Australia, New Caledonia, Mauritius, Madagascar, &c.

Mr. Oliver makes the following remarks on the habits of this crab, which is almost terrestrial in habit: "This land-crab occurs sparingly on the east coast of Sunday Island, and more commonly on Meyer Island and other islets of the Herald Group. They make burrows little more in diameter than the width of their bodies, and 6-20 in. long. Often, however, they are content with merely digging their way under a stone lying on the surface. I have never found more than one crab in each burrow. Their burrows are found in the forest at Coral Bay more than 100 yards from the sea. The presence of shells and pieces of coral high up on Napier Islet can only be accounted for by supposing these crustaceans carried them there, but for what purpose it is difficult to imagine. Mr. Roy Bell tells me that land-crabs are in the habit of carrying shells from the rocks up to where they make their burrows."

***Leptograptus variegatus* (Fabr.).**

Cancer variegatus Fabr., Ent. Syst., 2, p. 450, 1793. *Grapsus variegatus* Miers, Cat. N.Z. Crust., p. 36, 1876. *Leptograpsus variegatus* Fulton and Grant, Proc. Roy. Soc. Victoria, 19, pt. 1, p. 19, 1906; M. J. Rathbun, Proc. U.S. Nat. Mus., 38, pp. 547 and 588, 1910.

Several specimens were taken at Sunday Island. The Canterbury Museum collections also include one from the Kermadecs.

In Miers's catalogue it is included in the New Zealand fauna on specimens in the collections of the British Museum, but I do not know from what particular locality they were collected.

The species is found on the coasts of Peru and Chile, at Juan Fernandez, Australia, and other parts of the Southern Hemisphere.

***Cyclograpsus lavauxi* (Milne-Edwards).**

Cyclograpsus lavauxi and *Cyclograpsus whitei* M.-Edwards, Ann. Sci. Nat. (3^e ser.), 20, p. 197, 1853. *Cyclograpsus lavauxi* Miers, Cat. N.Z. Crust., p. 41, 1876. *Cyclograpsus audouinii* Dana, U.S. Explor. Exped., Crust., 1, p. 359, pl. 22, fig. 2, 1852.

Three spirit specimens washed up on Low Flat Beach, Sunday Island; also two dried specimens in logs washed up on the beaches, Sunday Island.

The species is common on New Zealand coasts, and is also found in Australia.

I follow Miers in referring our New Zealand form to this species, and in considering *C. whitei* as identical with *C. lavauxi*. Other closely allied

species are recorded from South Africa, the Indian Ocean, New Guinea, Tasmania, &c., and a careful review of the genus is desirable.

Planes minutus (Linn.).

Cancer minutus Linn., Syst. Nat., ed. 12, p. 1048, 1766. *Planes minutus* Miers, Cat. N.Z. Crust., p. 39, 1876; M. J. Rathbun, Proc. U.S. Nat. Mus., 38, p. 589, 1910; Stebbing, South African Crustacea, pt. 3, p. 43, 1905, and pt. 5, p. 320, 1910.

Several specimens washed up on Denham Bay Beach, Sunday Island, in October, 1908.

The species is pelagic in habit, and is very widely distributed in tropical and temperate seas. Specimens from New Zealand are in the British Museum collections.

Ocypoda kuhlii De Haan.

Ocypoda kuhlii Miers, Ann. Mag. Nat. Hist., ser. 5, 10, p. 384, 1882; Miers, Collection H.M.S. "Alert," p. 237, 1884.

Several specimens from Sunday Island seem to belong to this species as described by Miers. The carapace is evenly granulated throughout, as in some of the specimens examined by Miers. Specimens were obtained at Thursday Island during the cruise of the "Alert," and the species is known from other parts of Australia, and is also widely distributed elsewhere.

? *Cryptochirus coralliodytes* Heller.

? *Cryptochirus coralliodytes* Heller, S. B. Akad. Wien., 41 (1), p. 366, pl. 2, figs. 33-39, 1861; Grant and McCulloch, Proc. Linn. Soc. N.S.W., 1906, pt. 1, pp. 7 and 33, 1906; Calman, Trans. Linn. Soc., Zool., 8, p. 47, 1900.

Several female specimens from Meyer Island "in brain-coral, 2 fathoms"; also two or three small male specimens among other *Crustacea* from Coral Island.

The males are much smaller than the females, and are less modified from the normal Brachyuran type—just as is the case in *C. dimorphus* Henderson.*

Of the Meyer Island specimens Mr. Oliver says, "Lives in a perfectly circular hole bored in living brain-coral."

In general appearance and mode of life these specimens evidently closely resemble this species, but I have no means of consulting Heller's description.

Mr. McCulloch has kindly compared a specimen from the Kermadecs with those collected off the coast of Queensland by himself and referred to this species, and finds that they are identical. He states, however, that he is doubtful if these specimens should really be referred to *C. coralliodytes*, as they appear to differ in certain points, and he suggests that they probably form a new species, distinct also from *C. dimorphus* Henderson, from the Andaman Island. I postpone consideration of this question till I can consult Heller's description of *C. coralliodytes*.

* Ann. Mag. Nat. Hist., ser. 7, 18, p. 214, 1906.



Halimus spinosus Hess.

Halimus spinosus Hess, Archiv. für Nat., 1865, p. 129, pl. 6, fig. 1, 1865; Haswell, Cat. Aust. Crust., p. 6, 1882; McCulloch, Rec. Aust. Mus., 7, p. 53, 1908. *Halimus truncatipes* Miers, Ann. Mag. Nat. Hist., ser. 5, 4, p. 3, 1879; Baker, Trans. Roy. Soc. S.Aust., 29, p. 120, pl. 22, figs. 2, 2a, 1905.

One male with carapace 27 mm. long from rock-pools, Sunday Island (Captain Bollons); two smaller males from Meyer Island (W. R. B. Oliver); and one female with carapace 23 mm. long from Coral Bay, Sunday Island (T. Iredale).

These specimens agree closely with the description given by Miers for *H. truncatipes*, and undoubtedly belong to the same species as the specimen described by him; they also agree with the short description of *H. spinosus* given by Hess as quoted by Haswell, and I follow Haswell in considering these two species probably identical. According to Miers, *H. truncatipes* differs from *H. spinosus* by the much more squarely truncated joints of the ambulatory legs. In my female specimen, and particularly in the very small male specimen, these joints are less squarely truncated than in the large male, and the character is doubtless one that varies with the age of the specimen. The tubercles on the carapace agree very closely with the description given by Miers, and nearly all of them bear a number of yellow hooked or curved hairs. These are mentioned by Hess, but not by Miers, who only says that the legs are clothed with long fulvous hairs. In a dried specimen nearly all these hairs came away with the seaweeds when these were removed to expose the surface of the carapace. The median spine on the posterior margin of the carapace is moderately well marked in the female, but in the male is represented only by a small tubercle tipped with yellow hairs. Miers describes the chelipeds in the male as small; in my specimens they are somewhat swollen and smooth, with the fingers meeting only at the tip when closed, as in *H. laevis* Haswell. Both specimens bear on the carapace a number of seaweeds held by the curved hairs.

[I had written the above before I noticed that Mr. McCulloch had come to the same conclusion as to the identity of these two species, and that Mr. Baker also concurred after comparing Sydney specimens with those at first referred by him to *H. truncatipes*.]

Huenia proteus De Haan.

Maja (Huenia) proteus De Haan, Faun. Japon., Crust., p. 95, pl. 23, figs. 4-6, 1839. *Huenia proteus* Haswell, Cat. Aust. Crust., p. 9, 1882; Alcock, Journ. Asiatic Soc. Bengal, 64, p. 195, 1895; Miers, Coll. H.M.S. "Alert," p. 191, 1884.

One small specimen, 5 mm. long, from Meyer Island, 12 fathoms, appears to be an immature female of this species.

The species ranges from Japan and China southwards to the eastern coast of Australia, and is also found at the Andamans, in the Indian Ocean.

Schizophrys hilensis Rathbun.

Schizophrys hilensis Rathbun, Bull. U.S. Fish. Commission for 1903, pt. 3, p. 882, fig. 38, 1906.

I have several specimens from Coral Bay, Sunday Island, and from Meyer Island, which must, I think, be referred to this species. They agree

with Miss Rathbun's description in having no accessory spines on the rostrum: the superocular cave thick, projecting at its posterior angle into a sharp tooth; the post-ocular spine simple; in having two spines on the posterior margin of the carapace; and in most of the other characters. The carapace, however, appears smoother than in Miss Rathbun's specimens, and in the central part the spines mentioned by her are either absent altogether or indicated only by slight tubercles; the two cardiac spines and the intestinal spine are thus indicated in some specimens, but there seems no indication whatever of the three gastric spines. My largest specimen has the carapace from the tip of the rostral spines to the extremity of the spines on the posterior margin 17 mm. in length, and the width without spines 10 mm., thus corresponding with the dimensions given by Miss Rathbun. Her specimens are from the Hawaiian Islands.

Order EUPHAUSIACEA.

Thysanoessa gregaria G. O. Sars.

Thysanoessa gregaria G. O. Sars, Rep. Voy. "Challenger," 13, p. 120, pl. 21, figs. 8-17, and pl. 22, 1885.

Numerous specimens taken from the stomach of a kahawai fish (*Arripis trutta* Forster) caught at Denham Bay, 8th September, 1908.

The species is very widely distributed, especially in southern seas.

Mr. Oliver states that during September and October the surface waters of the bay were literally full of shrimps and shoals of kahawai, and that heaps of shrimps were washed up on the beach. Humpback whales appeared in considerable numbers, and probably fed on these shrimps.

These "shrimps" may have been of various kinds, but the present species and the Hyperids mentioned below are the only pelagic forms in the collection that are likely to have occurred in great numbers.

Order AMPHIPODA.

Nannonyx kidderi (Smith).

Nannonyx kidderi Chilton, Subant. Islands N.Z., p. 615, 1909 (with synonymy).

One small egg-bearing female from Coral Bay, Sunday Island.

This specimen seems to be quite the same as specimens from New Zealand that I have referred to this species. The telson has the sides considerably upturned, and bears one long and one short plumose seta on each margin; the posterior margin has a rather deep though fairly wide indentation, each portion ending posteriorly in two or three stout setae. Third uropod of normal shape for the species; the inner ramus very small.

Eurythenes gryllus (Licht.).

Gammarus gryllus (H. Lichtenstein) in Mandt., Observ. Groenl., p. 34, 1822.

Eurypporeia gryllus Chevreux, Résultats Campagnes Sci. Albert 1^{er} de Monaco, fasc. 16, p. 24, pl. 14, fig. 4. *Eurythenes gryllus* Stebbing, Das Tierreich Amphip., p. 73, 1906.

I have one imperfect specimen from Sunday Island which from its size and other characters certainly belongs to this species. The body is 35 mm. in length, and the shape of the different segments and of the side plates and the dorsal depression on pleon segments 3 and 4 agrees well with

that given for this species. The dorsal carina is well marked; it is pretty distinct on segments 4-7 of the peraeon and 1-4 of the pleon, and there is some indication even on the third segment of the peraeon. The specimen was evidently much decayed before it was collected, and nearly all the appendages are wanting; the greater part, however, of the second gnathopods is still present, and agrees well with the description given by other authors. The same is also true of the mouth parts, so far as I have been able to examine them.

The species is well known in northern seas, and has also been taken in various places in the Atlantic and near Cape Horn. Its occurrence at the Kermadecs is interesting, and shows that it probably distributed widely in southern seas.

It is celebrated as being one of the largest of the *Amphipoda*, the length sometimes being as much as 90 mm.

Moera mastersii (Haswell).

Moera mastersii Stebbing, Das Tierreich Amphip., p. 439, 1906 (with synonymy).

Two specimens from Coral Bay, Sunday Island.

In colour, shape of the body, eyes, and appendages these specimens agree closely with the description given by Stebbing.

The species is known from Torres Strait and Port Jackson.

Melita inaequistylis (Dana).

Melita inaequistylis Chilton, Subant. Islands N.Z., p. 630, 1909 (with synonymy).

One male specimen taken at low-water mark at Coral Bay, Sunday Island, by Mr. T. Iredale.

This specimen has the fourth pleon segment without teeth, the fifth with 2 or 3 small teeth, and the gnathopods show the characters usually present in adult specimens of this species from the main islands of New Zealand.

? *Melita palmata* (Montagu).

? *Melita palmata* Stebbing, Das Tierreich Amphip., p. 425, 1906 (with synonymy).

Two males and one female from Coral Bay, Sunday Island, appear to belong to this species.

It is only with much hesitation that I refer these specimens to this species, which, according to Stebbing, is known only from the North Atlantic and surrounding seas. In all three specimens the fourth pleon segment is produced dorsally to a compressed tooth, and segment 5 bears two small denticles, each with a bristle at the base, exactly as described by Stebbing for *M. palmata*, and the resemblance is very close in practically all the other characters, except that the lower antenna is nearly as long as the upper, and the secondary appendage of the latter consists of more than two joints—three in one specimen, and four in the others. The first gnathopod of the male is not specially modified, but has the propod and dactyl of normal shape, as in the female. The second gnathopod has the propod greatly enlarged and widened distally, but not produced into the rounded lobe shown in Sars's figure: the palm is moderately well defined, and is

rather convex, its margin being unevenly crenate; the dactyl is broad, subacute at extremity, and overlaps the propod.

There are some differences between my two male specimens, and it is evident from the account given by Stebbing that the gnathopods of this species have been differently described by different authors, the explanation probably being that these appendages vary considerably with age and sexual development.

The teeth on the pleon segments also show considerable variation in some of the species of *Melita*, so that the discrimination of the species is peculiarly difficult.

In the meantime I refer my specimens to *M. palmata*, the species to which they appear to agree most closely. They cannot be identified with the preceding species, *M. inaequistylis*, for they differ considerably in the teeth on the pleon segments and in the shape of the second gnathopod of the male; unless, indeed, we are here dealing with one cosmopolitan and variable species in which there are several forms of the male, as appears to be the case with the next species, *Aora typica* Kröyer.

Aora typica Kröyer.

Aora typica Chilton, Ann. Mag. Nat. Hist., ser. 5, 16, p. 370, 1885; and Subant. Islands N.Z., p. 645, 1909; Stebbing, Das Tierreich Amphip., p. 587, 1906.

One male from Coral Bay, Sunday Island, with first gnathopod of the type described as *A. gracilis* by Spence Bate, and mentioned as "form 2" in my first paper quoted above.

This particular form of the male is very widely distributed.

? *Orchestia gammarellus* (Pall.).

? *Orchestia gammarellus* Stebbing, Das Tierreich Amphip., p. 532, 1906 (with synonymy).

Numerous specimens "in sand under stones above tide-marks, Coral Bay, Sunday Island."

These specimens are all rather small and probably not fully mature, and none of the males show any enlargement of the merus and carpus of the fifth pereopods, but in all other respects they appear to agree closely with the description and figures of this species by Stebbing and Sars. They seem to be indistinguishable from New Zealand specimens that I have referred to this species.

Parorchestia tenuis (Dana).

Parorchestia tenuis Stebbing, Das Tierreich Amphip., p. 557, 1906 (with synonymy); Chilton, Subant. Islands N.Z., p. 642, 1909.

Four specimens from a fresh-water stream, Sunday Island.

These specimens are too close to New Zealand examples to be looked upon as a separate species. They differ, however, from Stebbing's description and from typical specimens in having the first gnathopod of the male slightly more slender and more spinous, and the outer rami of the first and second uropods provided with 2 or 3 small marginal spines.

In New Zealand the species is common in brackish water at the mouths of fresh-water streams, and occurs as far south as Campbell Island. An allied species, *P. hawaiiensis*, is found in the Hawaiian Islands.

Parorchestia sylvicola (Dana).

Parorchestia sylvicola Stebbing, Das Tierreich Amphip., p. 558, 1906 (with synonymy).

Sunday Island: seven males and twelve females, "under dead nikau-leaves, Expedition Hill, 26th May, 1908"; and ten males and two females, "under dead fern-leaves, Moumoukai, 27th June, 1908."

I cannot find any point in which these specimens differ appreciably from typical New Zealand examples of this species. It will be noted that in the specimens submitted to me the males—*i.e.*, the specimens with large second gnathopods—are more numerous than the females, though on the mainland of New Zealand males are usually very scarce. Whether this depends on the method of collecting—*i.e.*, selecting the largest specimens—on the season of the year, or on the characteristics of a local variety I cannot say. I have elsewhere drawn attention to the similar abundance of males in the collection of different species of *Parorchestia* from the subantarctic islands of New Zealand (see Subant. Islands N.Z., p. 603).

Phrosina australis (Stebbing).

Phrosina australis Stebbing, Rep. Voy. "Challenger," 29, p. 1431, 1888.

One large specimen, Sunday Island (Captain Bollons, 1907); two smaller ones washed up on Flat Beach, Sunday Island (W. R. B. Oliver, 1908).

I refer these specimens to this species, of which a single specimen, under a quarter of an inch in length, was taken by the "Challenger" at Station 164b, east of Australia.

Mr. Stebbing says that the only difference of importance he can discover between *P. semilanata* Risso and this species is that the first and second uropods, "instead of having broadly rounded extremities, are distinctly narrowed and acute, or nearly so; the telson also is less rounded apically than in the other species." In my specimens the pleopods and telson are rather imperfect, but so far as they can be observed they do not seem to differ much from the figure of *P. semilanata* given by Stebbing. In the other points mentioned by Stebbing my specimens seem to agree with his, but the differences from *P. semilanata* appear to be very trivial, and but for the locality in which they were found I should be inclined to refer my specimens to that species.

Phronima novae-zealandiae Powell.

Phronima novae-zealandiae Powell, Trans. N.Z. Inst., 7, p. 294, 1875; Stebbing, Rep. Voy. "Challenger," 29, p. 1356, 1888.

Several specimens washed up on Low Flat Beach, Sunday Island.

Platysceclus intermedius G. M. Thomson.

Platysceclus intermedius G. M. Thomson, Trans. N.Z. Inst., 11, p. 211, pl. 10b, fig. 4, 1879.

Several specimens from Sunday Island (Captain Bollons); one from stomach of a kingfish, Sunday Island (W. R. B. Oliver).

Mr. Stebbing says that this species "seems scarcely, if at all, distinguishable from *Platysceclus ovoides*."

Oxycephalus clausi Bovallius.

Oxycephalus clausi Stebbing, Rep. Voy. "Challenger," 29, p. 1583, pl. 202, 1888.

One specimen cast up on Terrace's Beach, Sunday Island, and two imperfect specimens washed up on Flat Beach.

The perfect specimen agrees closely with Stebbing's descriptions and figure. He points out that the species is nearly allied to *O. edwardsii* G. M. Thomson, which is occasionally washed up on New Zealand shores, but that there are differences in the gnathopods, the fifth pereopod, &c. In the Kermadec specimens "the postero-lateral angles of the first three segments [of the pleon are] produced into a short sharp point, behind which, at some distance, the hind margin forms a similar point" as described by Stebbing, while in *O. novae-zealandiae* it is only the hind margin that is produced into a point.

Caprella acutifrons Latreille.

Caprella acutifrons Mayer, Die Caprelliden der Siboga-Expedition, 24, p. 79, pl. 3, figs. 4-28; pl. 7, figs. 62-65; 1903.

A large number of specimens of both sexes and of various sizes "from husk of cocoanut washed up on Denham Bay Beach, Sunday Island."

These specimens show all the essential characters given by Mayer, and must be referred to this widely distributed species. The assignment of them to any one of the numerous varieties described by him is a much more difficult task; but in the shape of the second gnathopod, with its concave palm, &c., the thickened peduncle of the first antenna, and the lateral expansions of the third and fourth segments of the body they resemble var. *porcellio*, from the Cape of Good Hope.

Another variety occurs at Port Jackson, Australia, and the species as a whole is very widely distributed, though it has not been recorded from New Zealand.

Order ISOPODA.

Rocinela orientalis Schiödte and Meinert.

Rocinela orientalis Schiödte and Meinert, Naturhistorisk Tidsskrift, ser. 3, 12, p. 395, pl. 13, figs. 1-2, 1879; Stebbing, Trans. Linn. Soc., Zool., 14, p. 101, 1910; Richardson, U.S. Bureau of Fisheries, Document No. 736, 1910.

One ovigerous female cast up on Denham Bay Beach, Sunday Island.

This specimen agrees very closely indeed with Schiödte and Meinert's description and figures. The whole of the dorsal surface is light brown in colour.

They record the species from the Philippines and from Calcutta; the specimen examined by Mr. Stebbing was from Zanzibar.

Meinertia imbricata (Fabricius).

Oniscus imbricatus Fabricius, Mantissa Insectorum, 6, p. 241, 1787. *Ceratothoa banksii* Miers, Cat. N.Z. Crust., p. 105, 1876. *Meinertia imbricata* Stebbing, South African Crustacea, pt. 1, p. 58, 1900.

Several small specimens from Sunday Island (Captain Bollons, 1907); others from the throat of a "maomao" (*Scorpius aequipinnis*), Sunday Island (W. R. B. Oliver, 1908); and one collected by Mr. Roy Bell.

The species is widely distributed in the Indian Ocean, South Africa, &c.

Nerocila macleayii (Leach).

Nerocila imbricata Miers, Cat. N.Z. Crust., p. 107, 1876. *Nerocila macleayii* Chilton, Trans. N.Z. Inst., 23, p. 68, pl. 11, 1891.

Two specimens from Sunday Island, collected by Captain Bollons.

Dynamenella huttoni (G. M. Thomson).

Dynamene huttoni G. M. Thomson, Trans. N.Z. Inst., 11, p. 234, pl. 10A, fig. 6, 1876. *Dynamenella huttoni*, Chilton, Subant. Islands N.Z., p. 657, 1909.

One specimen collected at the islands by Captain Bollons.

The species is common on the New Zealand coasts, and has been recorded from the Antipodes Islands.

Cilicæa caniculata (G. M. Thomson).

Nesca caniculata G. M. Thomson, Trans. N.Z. Inst., 11, p. 234, pl. 10A, fig. 7, 1879. *Nesca caniculata* Miers, Collections H.M.S. "Alert," p. 309, 1884. *Cilicæa canaliculata* Hansen, Q.J.M.S., 49, p. 123, 1905.

One male and one female "on brain-coral, 2 fathoms, Meyer Island."

In the male the end of the abdominal process has been broken off, but I think there can be no doubt that the specimens belong to the same species as the New Zealand specimens known by this name.

An allied species, *C. latreillei*, with several varieties, is found in Australian seas, and appears to differ in the details of the abdominal process of the male and of the uropods in both sexes.

Idotea metallica Bosc.

Idotea metallica Bosc., Hist. Nat., Crust., 2, p. 179, pl. 15, fig. 6, 1802; Miers, Journ. Linn. Soc., 16, p. 35, 1881; Chilton, Trans. N.Z. Inst., 22, p. 193, 1890; Stebbing, Trans. Linn. Soc., Zool., 14, p. 108, 1910 (with further synonymy); Thielemann, Abhand. Math-phys. Kl. K. Bayer. Akad. d. Wissenschaften, 2, Suppl.-band, 3 Abhand., p. 63, 1910.

One specimen cast up on the beach, Sunday Island.

A pelagic species, almost cosmopolitan in distribution. It has been taken in New Zealand seas.

Ligia novae-zealandiae Dana.

Ligia novae-zealandiae Dana, U.S. Expl. Exped., 14, Crust., pt. 2, p. 739, pl. 49, fig. 2, 1853; Chilton, Trans. Linn. Soc., 8, p. 107, pl. 11, fig. 1, 1901.

Several specimens from Sunday Island.

I refer these to *L. novae-zealandiae* with some hesitation. They agree in most respects, but have the body narrower than is usually the case in that species, and the uropoda are somewhat longer and, especially in the peduncle, slightly more slender. These specimens agree closely with the description given by Miers of specimens from Port Moller which he describes under the name "*Ligia gaudichaudii* var. *australiensis* Dana." As Miers pointed out, *L. novae-zealandiae* (including *L. quadrata* G. M. Thomson) is very close to the species which he was then describing. I have numerous

specimens from Victoria and Hobart which I have considered to be *L. australiensis* Dana, and these, though very close to *L. novae-zealandiae*, differ in a few details in the appendages, especially in the male, and until a careful comparison can be made of specimens from different localities I prefer to keep the two species distinct, and in the meantime to look upon the Kermadec Islands specimens as a local variety of the New Zealand species.

Trichoniscus kermadecensis sp. nov. Fig. 3.

Body oblong-oval, greatest breadth about half the length, narrowing somewhat to each end, pleon not abruptly narrower than peraeon. Dorsal surface of head and peraeon scabrous with small spinose tubercles, mostly arranged in transverse lines, a few small ones on segments 3-5 of pleon, but remainder of pleon nearly smooth.

Head much broader than long, antero-lateral angles a little produced and rounded, frontal margin slightly convex, first segment of peraeon with antero-lateral angles reaching half-way along the lateral margins of the head, posterior margin straight, posterior angles rectangular and slightly rounded; posterior angles of the second segment similar, those of the third to the seventh segments progressively more produced and acute, those of the seventh reaching almost to the end of the epimera of the third segment of the pleon; third, fourth, and fifth segments of pleon with fairly well-developed and evident epimera, terminal segment triangular, posterior margin straight with angles slightly rounded and bearing 3 or 4 minute setules.

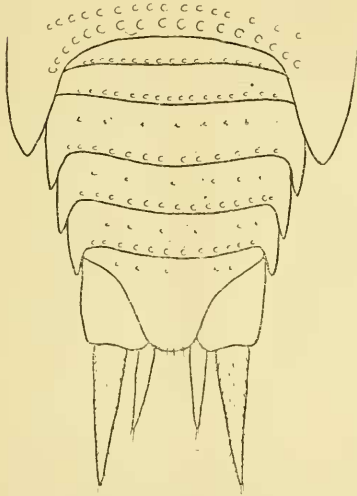


FIG. 3.—*Trichoniscus kermadecensis*:
Pleon and uropoda.

Eyes of three ocelli slightly separated from one another.

Antennae rather stout, fourth joint of peduncle slightly tuberculated, fifth as long or longer and more slender, its anterior margin with 3 or 4 spiny tubercles, posterior margin with fine setae, flagellum slightly longer than the last joint of peduncle, indistinctly divided into 5 joints, with the usual pencil of long setae at the end. Uropods with basal joints very broad, extending a little beyond the posterior segment, outer ramus one and a

half times as long as the base, inner ramus about half as long as the outer, its base concealed by the basal joint in dorsal view, both with a fur of fine setae and with a few long setae at the end.

Length of body, 4 mm.; breadth, 2 mm.

Colour.—Greater part of dorsal surface dark brown or almost black, with 2 broad indistinct bands of lighter markings a little to each side of the median line; some specimens much lighter in colour than others.

Hab.—Four specimens, labelled "Fresh-water stream, Sunday Island." It is probable, however, that these animals do not habitually live in the water, but in damp moss, &c., on the banks of the stream.

In the size, form of the body, character of the dorsal surface and of the appendages this species is close to *T. commensalis* Chilton, which is commonly found in ants' nests in New Zealand. That species differs, however, in colour and in the greater compactness of the body and in the shorter antennae and uropods, and it has the tubercles on the dorsal surface much better marked.

Philoscia oliveri sp. nov. Fig. 4.

Elongate-oval, widest at fourth and fifth peraeon segments, narrowing slightly anteriorly and posteriorly, dorsal surface with small sparsely scattered hairs. First two segments of peraeon with margin very slightly sinuous, first segment slightly longer than the others, postero-lateral angles of segments 5, 6, and 7 somewhat produced but not acutely, those of seventh segment reaching to the middle of the lateral margin of the second pleon segment. Pleon abruptly narrowed; first two segments a little shorter than the others: third, fourth, and fifth with very small adpressed epimera; last segment broader than long, sides slightly sinuous; extremity broadly rounded and bearing a few setules.

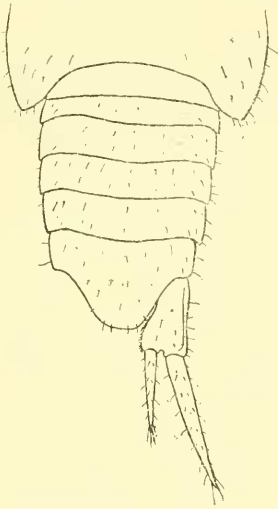


FIG. 4.—*Philoscia oliveri*: Pleon and uropod.

Antennae about half as long as the body, hirsute, second and third joints subequal, the fourth shorter than the fifth, and subequal with flagellum, the 3 joints of which are of about equal lengths. Uropods with the base extending beyond the telson, narrowed proximally, its outer side grooved and inner margin with a dense fringe of very short setae, inner ramus arising a little anterior to the outer and about half as long, both slender and hirsute; total length of uropod nearly equal to that of pleon.

Length, 5 mm.; greatest breadth, 2 mm.

Colour.—Light brown, with marblings of darker brown sometimes forming indistinct longitudinal bands, one central and two lateral. Mr. Oliver notes that the species is "very variable in colour."

Hab.—Expedition Hill and Mount Junction, Sunday Island: several specimens from each locality.

This species appears to belong to the same section of the genus as *P. pubescens* Dana from New Zealand, *P. mina* Budde-Lund and *P. hirsuta* Budde-Lund, both from the Cape of Good Hope. I have specimens, not yet described, from Norfolk Island which are a little broader and a little darker in colour, but which appear to be only a variety of the present species. *P. lifuensis* Stebbing, from the Loyalty Islands, presents some resemblances, but differs in the outline of the body and in the much shorter pleon and uropods.

I have named this to indicate my indebtedness to Mr. W. Reginald B. Oliver for the opportunity of examining the fine collection of *Crustacea* he made at the Kermadec Islands in 1908.

Metoponorthus pruinus (Brandt).

Porcellio pruinus Brandt, *Conspectus Oniscidorum*, pp. 181 (19), 188 (26), 1833. *Metoponorthus pruinus* Budde-Lund, *Crust. Isop. Terrest.*, p. 169, 1885; Chilton, *Ann. Mag. Nat. Hist.*, ser. 7, 16, p. 428, 1905; and *Trans. N.Z. Inst.*, 38, pp. 64, 65, 1906; Stebbing, *Ann. South African Mus.*, 6, p. 440, 1910.

Numerous specimens found under logs, stones, &c., at Denham Bay, Sunday Island.

Mr. Oliver says of these specimens, "Perhaps introduced," and they certainly belong to this European species, which has now been distributed to most of the temperate regions. I have already discussed its occurrence in Norfolk Island and New Zealand in the papers quoted above.

Subclass CIRRIPEDIA.

Order THORACICA.

Lepas pectinata Spengler.

Lepas pectinata Darwin, *Cirripedia (Lepadidae)*, p. 85, pl. 1, fig. 3, 1851; Hutton, *Trans. N.Z. Inst.*, 11, p. 329, 1879; Gruvel, *Cirrhipèdes*, p. 107, fig. 119, 1905.

Numerous specimens from Sunday Island; some on *Spirula* shells. They agree well with Darwin's description.

The species is very widely distributed, and was recorded from Auckland, New Zealand, by Hutton in 1879.

Lepas denticulata Gruvel.

Lepas denticulata Gruvel, *Cirrhipèdes*, p. 107, fig. 118, 1905.

A few small specimens collected at Sunday Island by Captain Bollons in 1907 appear to belong to this species.

They agree well with the figure given by Gruvel, differing from *L. pectinata* in having the ridge on the scuta from the umbo to the apex situated some distance from the convex occludent margin; the carina is dorsally crested, and bears 4 or 5 well-marked teeth, but I cannot make out the projecting points on the two branches of the inferior fork, nor is the tooth on the internal umbonal angle of the left scutum distinguishable.

Gruvel's specimens are from the Philippines.

Lepas anatifera Linnaeus.

Lepas anatifera Darwin, *Cirripedia (Lepadidae)*, p. 73, pl. 1, fig. 1, 1851; Gruvel, *Cirrhipèdes*, p. 103, fig. 121, 1905; Stebbing, *Ann. South African Mus.*, 6, p. 563, 1910.

Numerous specimens which I refer to this species were obtained from Sunday Island.

These specimens can be separated pretty easily into three varieties. A few of them agree pretty closely with the type of this species as described by Darwin: in them the valves are almost smooth, the radiating lines not being prominent; the carina is rather narrow and fairly acuminate at the end. Many other specimens have the carina more or less distinctly barbed, and agree well with Darwin's "var. (b)"; in these the radiating

lines on the scuta are more distinct than in the specimens already referred to. A few specimens differ from both of the varieties already mentioned in having the carina much broader and less acuminate, not barbed, and in having little or no trace of an internal tooth on either scutum. The radiating lines on both scuta and terga are fairly distinct. These specimens therefore differ from the typical form of *L. anatifera* in the absence of the internal tooth on the right-hand scutum and in the shape of the carina. In some respects they seem to come pretty close to *L. testudinata* Aurivillius, from the Cape of Good Hope. They differ, however, from that species, as described and figured by Gruvel, in the broader carina and in the shape of its fork, and apparently also in having 5 teeth on the mandibles. Neither of these points is of much importance, and but for the absence of the internal tooth on the scutum there is perhaps little to distinguish *L. testudinata* from *L. anatifera*. In my Kermadec Island specimens both the scuta have the umbonal angle somewhat incurved, but there is nothing that can strictly be called a tooth on either of them. For the present I prefer to look upon these specimens as a variety of the widespread and variable *L. anatifera*. It differs from *L. hillii* in having only two filaments. I have numerous specimens from the Chatham Islands that appear to be practically identical with this variety from the Kermadecs.

L. anatifera is almost cosmopolitan, but has not been recorded from New Zealand seas.

Lepas fascicularis Ellis and Solander.

Lepas fascicularis Darwin, Cirripedia (Lepadidae), p. 92, 1851; Gruvel, Cirripèdes, p. 105, fig. 116, 1905; Stebbing, Ann. South African Mus., 6, p. 564, 1910.

A single specimen washed up on Sunday Island.

This specimen has the short peduncle completely surrounded by a spherical mass formed of the secretion of the cement-glands, the whole forming a float, as described by Darwin.

Subclass OSTRACODA.

Order PODOCOPA.

Cypridopsis minna (King).

Cypris minna King, Proc. Roy. Soc. Van Diemen's Land, 3, p. 64, pl. 10B.
Cypridopsis minna G. O. Sars, Fresh-water Entomostraca of N.Z., Vidensk. Selsk. Skr., 1, M.-N. Kl., No. 5, p. 30, pl. 4, figs. 3 *a-d*, 1894.

A few specimens from fresh-water swamps, Denham Bay, appear to belong to this species.

They agree well in shape of the valves with Sars's description and figures. The species is very near to *C. viridis* Thomson, and, like it, is found both in New Zealand and in Australia.

Ilyodromus smaragdinus G. O. Sars.

Ilyodromus smaragdinus G. O. Sars, Fresh-water Entomostraca of N.Z., Vidensk. Selsk. Skr., 1, M.-N. Kl., No. 5, p. 43, 1894.

Specimens from fresh water in swamps at Denham Bay and from under stones in shallow water, Green Lake, agree well with Sars's descriptions.

The type specimens were raised by Sars from dried mud from the neighbourhood of Dunedin, but the species doubtless occurs more widely in New Zealand.

I have several specimens of another Ostracod with the shell light-coloured, with 3 or 4 irregularly scattered patches of black or very dark-blue pigment on each valve. These I have not been able to identify.

Subclass BRANCHIOPODA.

Order CLADOCERA.

Daphnia thomsoni G. O. Sars.

Daphnia similis Thomson, Trans. N.Z. Inst., 16, p. 240, pl. 13, figs. 6-9, 1881. *Daphnia thomsoni* G. O. Sars, Fresh-water Entomostraca of N.Z., Vidensk. Selsk. Skr., 1, M.-N. Kl., No. 5, p. 5, 1894; Stebbing, Ann. South African Mus., 6, p. 489, 1910. *Daphnia similis* Claus var. *thomsoni* Richard, Ann. Sci. Nat., ser. 8, vol. 2, p. 217, pl. 25, figs. 13, 14, 1896.

Numerous specimens from fresh water in swamps at Denham Bay; collected on 20th June, 28th July, and 28th September, 1908.

I have been able to compare these specimens with some from the type locality, Eyreton, North Canterbury, New Zealand, and can detect no difference except that the Kermadec specimens have both the head and the body a little less broad. In them, too, the spine of the carapace is longer than in most of my New Zealand specimens, but the length of this varies, and, according to Sars's observations, is longest in specimens of the earliest generations, in these attaining nearly half the length of the carapace, as in the Kermadec specimens. It will be noticed that Mr. Oliver's collections were all made early in the season, the first on the 20th June.

The species is known both from New Zealand and from the Cape of Good Hope.

Dr. Jules Richard considers *D. similis* Thomson simply a variety of the widely distributed species of the same name earlier established by Claus.

Subclass COPEPODA.

Order EUCOPEPODA.

Numerous specimens of a *Cyclops* were obtained in the fresh waters of the swamp at Denham Bay, and also from among weeds in Green Lake, but I have not yet been able to identify them satisfactorily with any of the numerous species of this genus known from Australia and New Zealand.

A few specimens of a *Pontella* were washed up on Flat Beach, Sunday Island, on the 6th June, 1908. The species has not yet been determined.

In the collection are also two parasitic *Copepoda*, one apparently a *Lepeophtheirus*, taken on the hapuka; and the other, which appears to belong to *Pandarus*, on a shark. Neither species satisfactorily identified.